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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,216	12/15/2003	Steven Leo Sullivan		8748
22191	7590	03/02/2006	EXAMINER	
GREENBERG-TRAURIG 1750 TYSONS BOULEVARD, 12TH FLOOR MCLEAN, VA 22102			HOLZEN, STEPHEN A	
			ART UNIT	PAPER NUMBER
			3644	

DATE MAILED: 03/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/734,216	Applicant(s) SULLIVAN, STEVEN LEO	
	Examiner Stephen A. Holzen	Art Unit 3644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Notes to Applicant

1. Regenerative brakes are most commonly seen on electric (hybrid) vehicles. Electric regenerative brakes descended from dynamic brakes (rheostat brakes), which have been used, on electric locomotives and streetcars since the mid-20th century. In both dynamic and regenerative braking, braking is accomplished by switching motors to act as generators that convert motion into electricity instead of electricity into motion. A significant difference between regenerative and dynamic braking is that dynamic brakes dissipate heat through banks of resistors and regenerative braking generates electricity, which is then stored in a battery or other capacitor bank for future use. It is well known in the art, that traditional friction based brakes must also be provided when power braking is required. It appears that applicant believes his inventions novelty resides in the use of regenerative braking for an aircraft landing gear, and not in the regenerative braking itself. The examiner believes this due to the abundance of regenerative and dynamic braking system found in the automotive and train arts.

2. For example see DeVries (5,721,473) who teaches an electric motorized vehicular wheel that uses wire coil stators and interchangeable permanent and electromagnetic rotors to roll and stop a load. DeVries uses capacitorized hubcaps that hold electricity to roll, steer and brake a load while recapturing all available kinetic energy from rolling and braking. DeVries uses rotors, stators and magnetism to drive and brake the wheels.

3. For example Yanase et al (6,318,487). Yanase discloses regenerative control device for a hybrid electric vehicle, which charges a battery with power regenerated as a result of the regenerative braking and which also ease the burden of a friction brake. (See Col. 1, lines 32-35). The generated power is transmitted to a battery 12.

4. For example see Brainard (2,564,320). Brainard teaches a permanent magnet type electric generator. The generator has two relatively moving elements one a rotor and the other a stator, one of the elements being characterized by permanent magnets delivering magnetic flux to poles adjacent the other element and the other element is characterized by windings that cut the magnetic flux while a magnetized member regulated the magnetic flux. Brainard further teaches that the features of the rotors may be incorporated in the stator instead of the rotor and the features that are incorporated in the stator may be incorporated in the rotor instead of the stator. (See Col. 2, lines 42-50). Brainard basically uses a magnet M to produce magnetic flux at poles P that interact with windings W to cut the magnetic fields or the magnetic flux from the poles. Brainard further teaches, "As the rotor turns within the stator, the magnetic flux produced by the fixed magnets M is picked up and communicated through the member F."

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 23, 33-37, 38, 39, 40, 43, are rejected under 35 U.S.C. 103(a) as being unpatentable over Yarber (3,017,145).

Yarber (3,017,145) teaches an apparatus that uses electrical generation to control the application of fluid brakes. The electricity and magnetism is not the primary braking force, however the interaction between the stator and rotor would never the less interact in such a way that would decrease the rotation velocity of the aircraft's landing gear. These system employ a plurality of stators, rotors, magnets and coils to generate electricity as the landing gear wheel rolls on the ground. Furthermore it should be appreciated that it is well known in the art for aircraft to have more than one landing gear. In most cases the landing gear comprises nose and a pair of landing gear. (See for example wikipedia.org "Undercarriage") that illustrates a Airbus A330 having at last nine independently rotatable wheels.

It would have been obvious therefore to use the prior art regenerative braking systems taught by Yanase et al, Brainard et al or DeVries in an aircraft for the purpose of reducing the amount of fossil fuels consumed during flight.

It should be appreciated that the applicant's functional language in the claims does not serve to impart patentability. While features of an apparatus may be recited either structurally or functional, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. Apparatus claims cover what a device is, not what a device does. A claim containing a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior apparatus teaches all the structural limitation of the claims. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d, 1429, 1431-2 (Fed. Cir. 1997); Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990); Ex parte Masham, 2 USPQ 2d 1647 (Bd. Pat. App. & Inter. 1987).

The examiner considers the fluid braking system of Yarber "friction-type" brakes.

The rotors and stators of Yarber do interact to some extent to convert electrical energy into a braking torque and converting the motion of the wheel into electricity.

The circuitry for Yarber acts as a processor that is programmed to behave in a specific manner.

Yarber further teaches a dissipation device (fluid braking system) and a energy storage device (wires).

7. Claims 25, 27, 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yarber as applied to claim 43 above, and further in view of Hopkins and further in view of ordinary skill in the art. Yarber does not disclose that the coils are within a carbon material. Hopkins however discloses that it is well known in the art to embed the coils within a material as illustrated in Figure 5. It would have been obvious to embed the coils of Yarber into either the rotor or the stator for the purpose of reducing maintenance costs associated with assembly and cleaning. Neither Yarber nor Hopkins teaches a carbon material for embedding the coil therein. It should be appreciated however that Carbon Nanofoam, discovered in 1997, and is a good insulator and is capable of being exposed to thousands of degree Fahrenheit before deforming. One of the most unusual properties displayed by carbon nanofoam is that of ferromagnetism, it is attracted to magnets. (See "What is Carbon Nanofoam?" www.wisegeek.com). It would have been obvious to embed the coil within a carbon nanofoam since carbon nanofoams provide excellent structural capabilities under intense heat.

8. Claim 26 and 28 rejected under 35 U.S.C. 103(a) as being unpatentable over Yarber as applied to claims 25 and 27 above, and further in view of Hoag (3,292,021). Yarber does not disclose using a superconductor to generate electricity. Hoag however teaches that a superconducting conductor is well known means for generating a magnetic field. It would have been obvious to one having ordinary skill in the art, at the time the invention was made to employ a superconducting wire coil within the carbon

nanofoam since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin 125 USPQ 416.

9. Claims 43 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yarber. Regenerative brakes are most commonly seen on electric (hybrid) vehicles. Electric regenerative brakes descended from dynamic brakes (rheostat brakes), which have been used, on electric locomotives and streetcars since the mid-20th century. In both dynamic and regenerative braking, braking is accomplished by switching motors to act as generators that convert motion into electricity instead of electricity into motion. A significant difference between regenerative and dynamic braking is that dynamic brakes dissipate heat through banks of resistors and regenerative braking generates electricity, which is then stored in a battery or other capacitor bank for future use. It is well known in the art, that traditional friction based brakes must also be provided when power braking is required. It appears that applicant believes his inventions novelty resides in the use of regenerative braking for an aircraft landing gear, and not in the dynamic braking itself. The examiner believes this due to the abundance of dynamic braking system found in the train arts. Yarber teaches that it is known to generate electricity from rotors and stators on the landing gear of aircraft. It would have been obvious to one having ordinary skill in the art to employ a dynamic braking system from eclectic locomotives in an aircraft landing gear for the purpose of reducing the wear and tear on aircraft disk braking systems.

10. Claim 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yarber as applied to claim 30 above, and further in view of Brainard (2,564,320). Brainard discloses a stator and a rotor for generating electricity in which the features of the stator can be used in a rotor, and the features of a rotor can be used in the stator. (See Col. 2, lines 41-50). It would have been obvious to one having ordinary skill in the art to have rotors comprise the conducting wire and the stators comprise the conducting material (or vice versa) as taught by Brainard.

11. Claims 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yarber as applied to claim 43 above, and further in view of Yanase et al. Yarber does not disclose using a battery to store the excess electrical energy. Yanase however teaches that it is well known in the regenerative electricity art to store the electricity in a battery (capacitor) when it is not presently needed, and can be used in the future. It would have been obvious to one having ordinary skill in the art, at the time the invention was made to outfit the braking device of Yarber with a battery for saving electrical energy that was generator that is over and above the amount needed for the operation of the fluid braking system for the purpose of energy conservation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen A. Holzen whose telephone number is 571-272-6903. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Teri Luu can be reached on 571-272-7045. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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MICHAEL J. GARONE
SUPERVISORY PATENT EXAMINER